

Introduction to IHEP

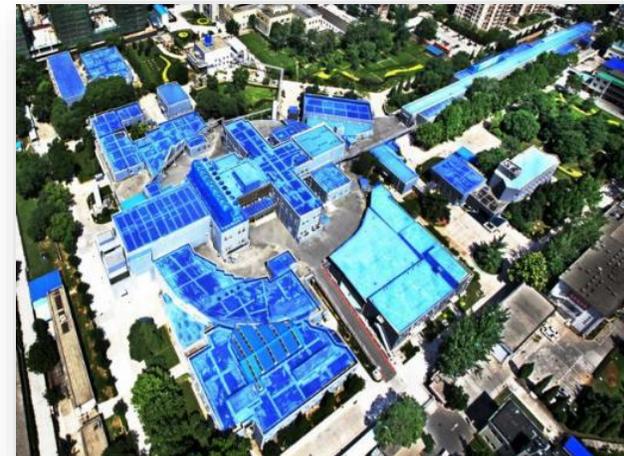
Liangjian Wen



**Institute of High Energy Physics
Chinese Academy of Sciences**

Overview of IHEP

- The largest research institute on basic science in China, with 4 campuses, 1521 employees, 230 postdocs, 790 graduate students
- A world-class research center for high energy physics, astro-particle physics and multi-disciplinary research with synchrotron radiation facilities and a spallation neutron source



Shijingshan, Beijing

Beijing Electron Positron
Collider



Dongguan, Guangdong

China Spallation Neutron
Source



Huairou, Beijing

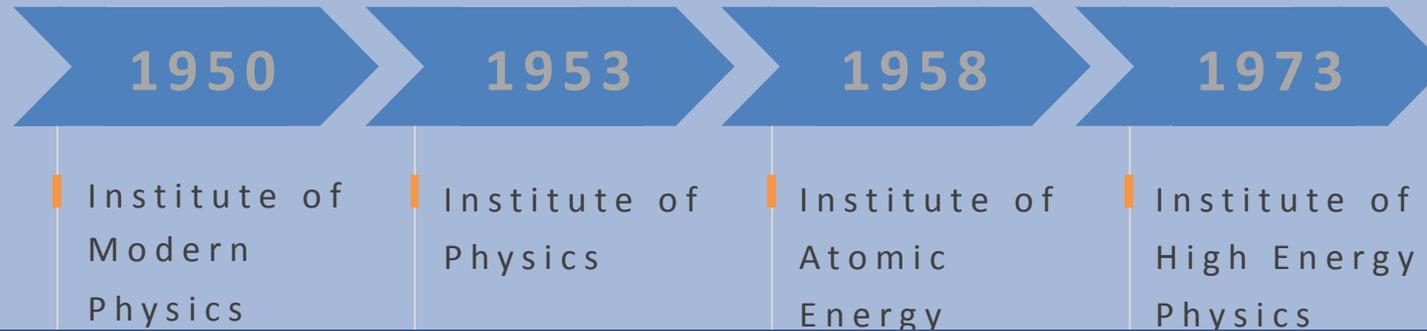
High Energy Photon Source



Jinan, Shandong

Technology Transfer

History



The institute starts from the construction of Beijing Electron Position Collider (BEPC) in 1980s, and now becomes a large research center

Frontiers of Basic Science

Particle & Astro-particle Physics

- Accelerator-based HEP Experiments
- Particle Astrophysics & Neutrino Experiments
- Particle Detection and Electronics
- Particle Physics Theory

Strategic High-Tech

Accelerator Physics and Technologies

- High Luminosity Electron Accelerators
- High Intensity Proton Accelerators
- Applied Research and Technology Transfer

Multi-disciplinary research

Radiation Technologies and Applications

- Synchrotron Radiation & Applications
- Neutron Scattering & Applications
- Nuclear Analytical Techniques & Applications

Basic research, Technological Research and Development,
Engineering Construction and Management

Research Field

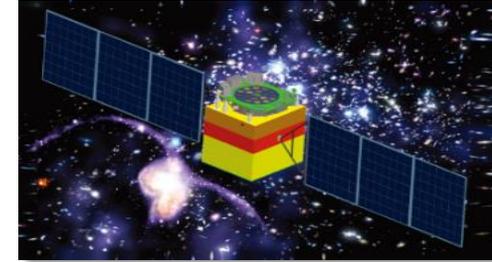
Particle Physics

- Tau-Charm at BEPCII
- Neutrino(Daya Bay, JUNO)
- Higgs(LHC, CEPC)
- Theoretical physics
- Detector technology



Astro-Particle physics

- X-rays in space(HXMT)
- Cosmic-rays at high altitude(LHAASO)
- CMB detection(ALICPT)
- Detector and Space technology



Accelerator Physics & Tech.

- Design and construction of e+e- collider(BEPC,CEPC)
- Spallation neutron sources(CSNS)
- Light sources(BSRF,HEPS)
- Accelerator technology



Multi-Disciplinary Research

- Synchrotron radiation and neutron beams (BSRF, HEPS, CSNS) and related in-house research
- Nuclear technology for trace analysis, Radiochemistry, etc.
- X-ray technology



Also: **Computing Tech.**

Applications and Technology Transfer

Lar

Join in EP, SVOM...

enhanced X-ray Timing and Polarimetry mission (eXTP)

Insight Hard X-ray Modulation Telescope (HXMT)

Gravitational wave Electromagnetic Counterpart All-sky Monitor (GECAM)

Huairou Campus High Energy Photon Source (HEPS)

IHEP, Beijing Campus Beijing Electron-Positron Collider (BEPC)

Jinan Branch

YBJ International Cosmic Ray Observatory (retirement)

Ali CMB Polarization Telescope (AlicPT-1)

Large High-Altitude Air Shower Observatory (LHAASO)

Daya Bay Neutrino Experiment(Daya Bay) (retirement)

Jiangmen Underground Neutrino Observatory (JUNO)

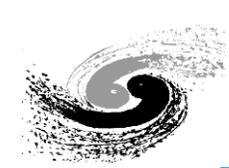
Dongguan Branch China Spallation Neutron Source (CSNS)

- ★ 北京 首都
 - 天津 省级行政中心
 - 保定 地级市行政中心
 - 和田 县级行政中心
- 1 : 16 000 000

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Particle Physics – Experimental Physics Division

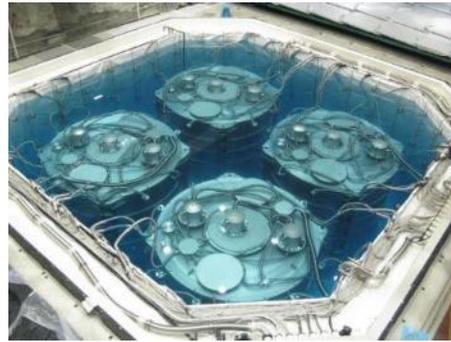
169 Staff, 397 Temporary (including postdoc, students)

Complete chain of design, construction, and operation of large-scale experiments, R&D of advanced technology



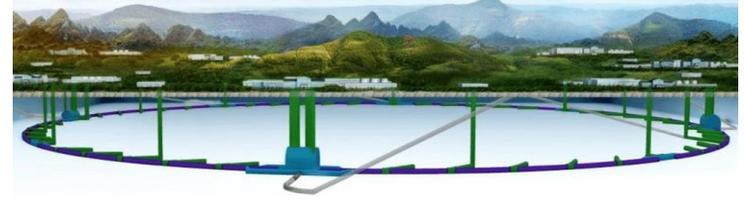
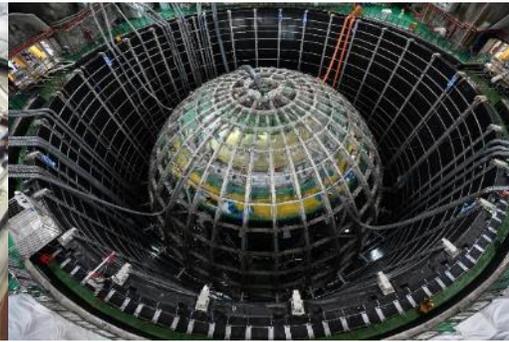
Charm Physics

BESIII, BelleII, PANDA, GlueX



Neutrino Physics

Daya Bay, JUNO, EXO, DarkSide, COMET



High Energy Frontier

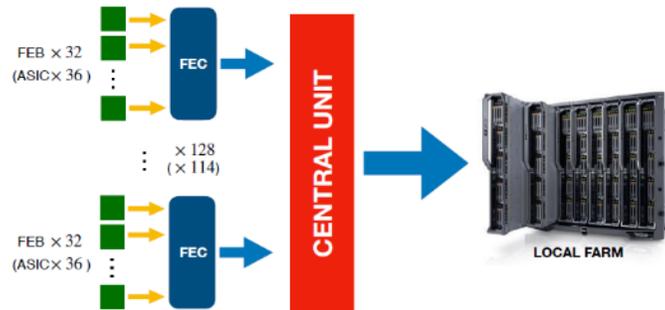
CEPC, LHC (ATLAS/CMS/LHCb)



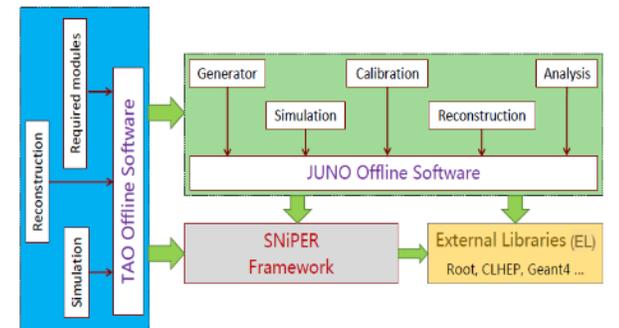
Detector



Electronics



Trigger, DAQ, DCS



Software

Particle Astrophysics Division

180 Staff, 200 Temporary

- The origin of **cosmic rays**
- Extreme gravity and magnetic fields of **black holes/neutron stars**
- **Primordial gravitational waves** and cosmic expansion

Under development



About to launch



In operation



Primordial gravitational waves
(ultra-high energy scale)

X-ray

Gamma-ray

UHE gamma-ray

Ali-CPT
(microwave)

LACT
(under development)





Accelerator Technology – Accelerator Division

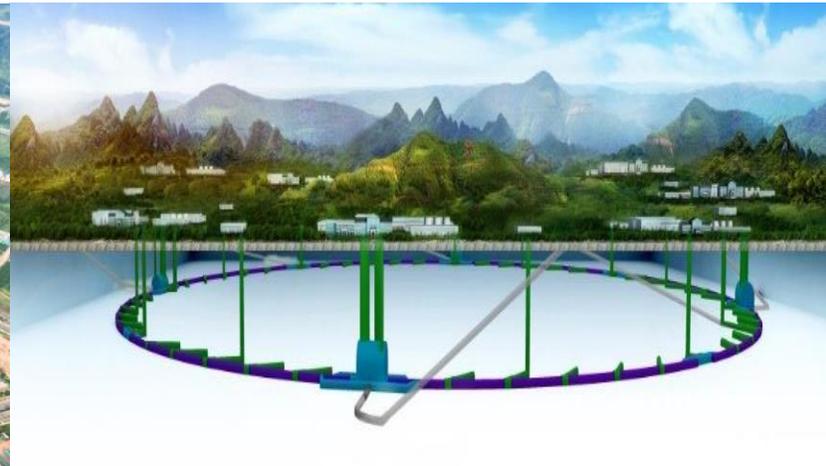
255 Staff, 144 Temporary



BEPC



HEPS

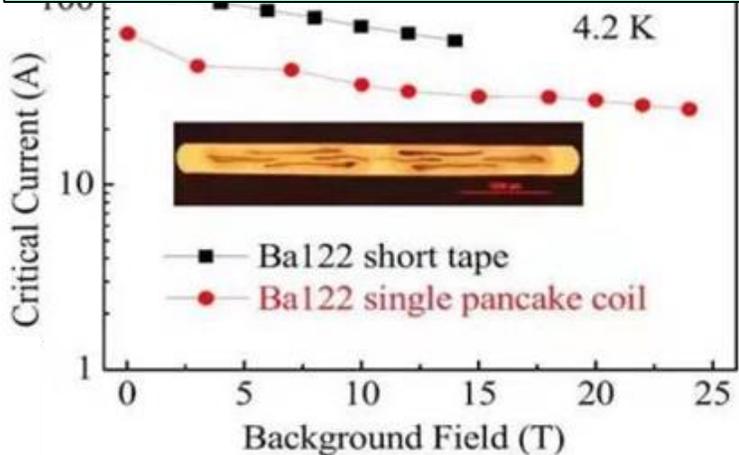


CEPC



Accelerator key technology R&D platform

World first **Iron-based Superconducting solenoid coil at 24T**



Backup solution for CEPC linac
Wakefield Acc.

Test facility to be built at BEPCII

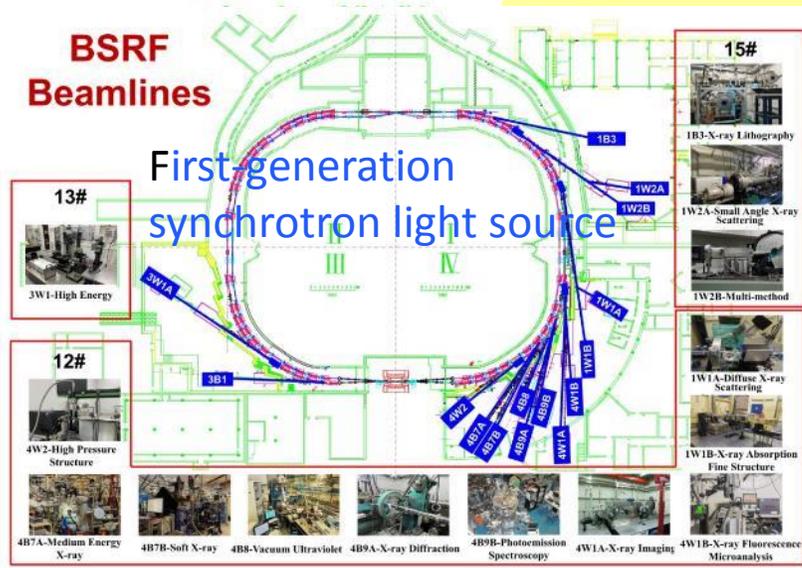
Hall 10: 35m x 14m

Clean room ~200m²
Equipment room on 2nd floor

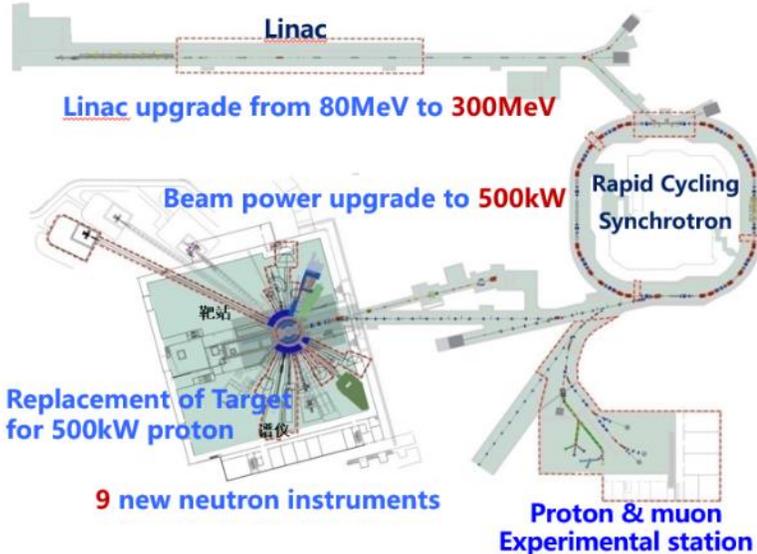
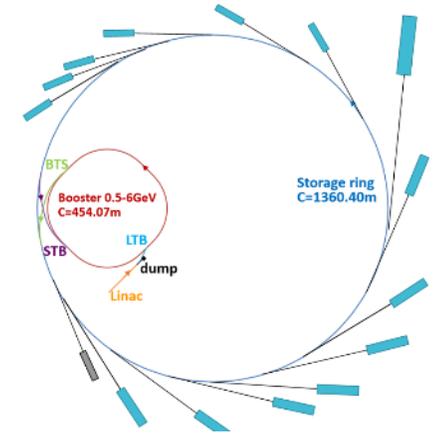


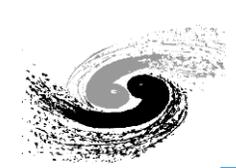
Light Source, Neutron Source, Multi-Disciplinary

Multi-Disciplinary Division, 235 Staff, 289 Temporary



HEPS Beamline phase-I





◆ Division of Nuclear Technology and Application (and Jinan Branch)

- ⇒ 57 staff, 47 temporary
- ⇒ Focus on instrumentation, engineering and system development
- ⇒ Nuclear medical imaging; Non-destructive testing (NDT); Radiation safety monitoring

◆ Theoretical Physics Division

- ⇒ 27 staff, 60 temporary. Has best students at IHEP.
- ⇒ One of the best theory groups in China
- ⇒ Hardon physics; LQCD; Neutrino; Higgs/TeV physics; Precision QCD+EW; Cosmology

◆ Computing Center

- ⇒ 49 staff, 39 temporary
- ⇒ 100k CPU cores, 100 PB disk storage, 100 PB tape storage
- ⇒ LHCb Tier-1 site, ATLAS and CMS Tier-2 sites
- ⇒ Advanced computing, storage, and network technology; software development; AI and QC



IHEP “1-7-5 Development Plan”

One Vision: One of the world’s leading particle physics research centers, and a world-class, large-scale, comprehensive, multidisciplinary research base.

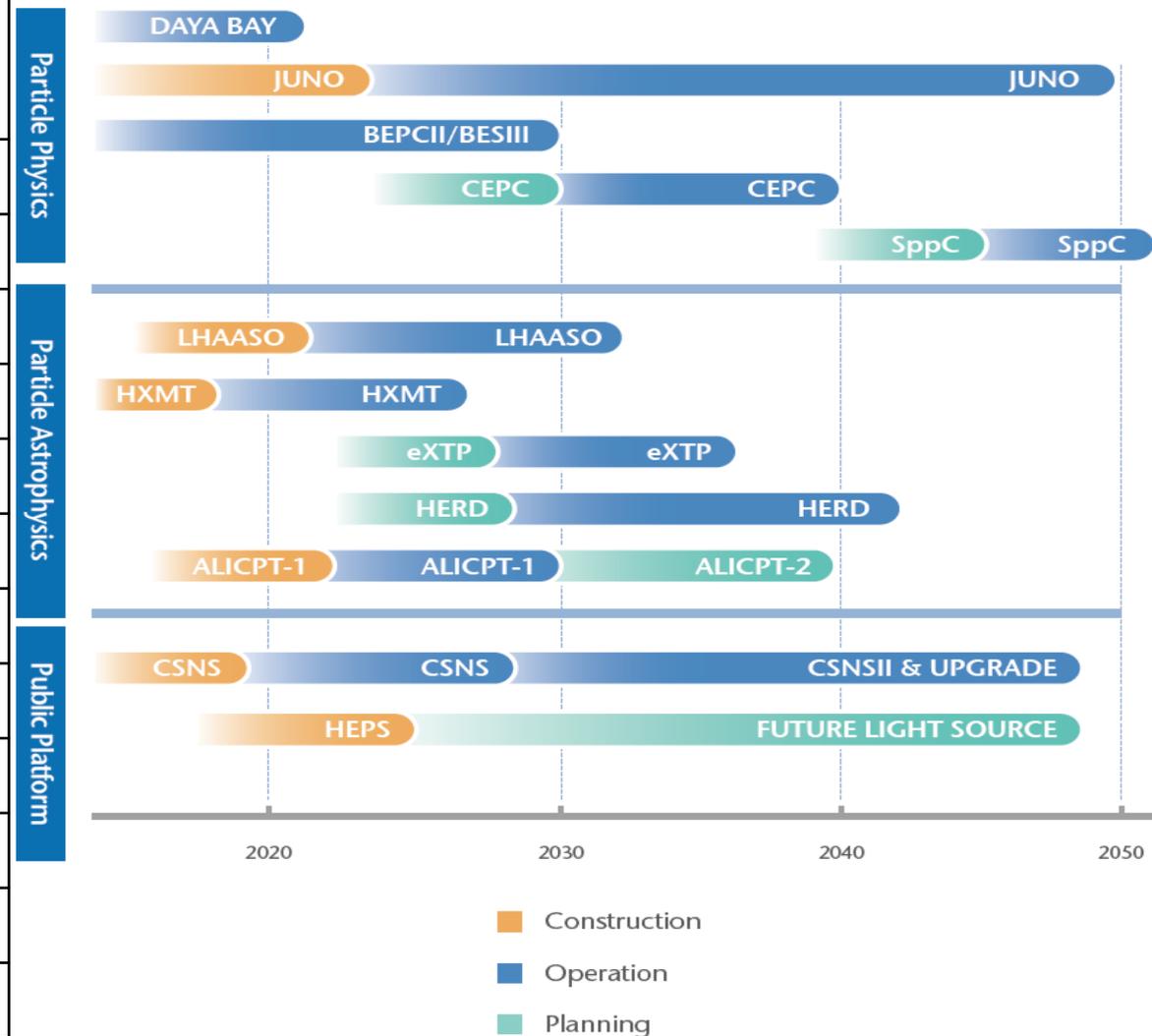
Seven Priority Development Areas

1. Charm physics
2. Neutrino physics
3. Particle Astrophysics
4. High Energy Photon Source
5. CSNS-II and SAPS
6. Key tech of large-scale research infrastructures
7. Development and application of radiation tech

Five Emerging and Frontier Areas

1. High Energy Colliders and Collider Physics
2. Extreme universe and high energy cosmic rays
3. Quantum computing and AI in HEP
4. Plasma wakefield acceleration
5. Electronic technology for wireless detectors

Large Science Facilities – long term plan



International Cooperation: Bilateral and multi-lateral

- **Join international science projects**
- ATLAS, CMS, LHCb , AMS, Belle-II, PANDA, COMET, ILC , EXO/nEXO, etc.
- **Attract international partners to join China-based projects**
- BESIII, Daya Bay, JUNO, LHAASO, **CEPC, eXTP, HERD**, etc.

- **China-US**

- ✓ the Sino-U.S. Joint Committee on High Energy Physics (1979-2017)

- **China-CERN**

- ✓ since 2019 (Cooperation started in the 1970s)
- ✓ LEP, LHC , HL-LHC, etc.



- **China-France**

- ✓ France-China Particle Physics Laboratory (FCPPL) established in 2007



- **China-Japan**

- ✓ KEK-IHEP Annual Cooperation Meeting: since the 1990s



- **China-Italy**

- ✓ China-INFN: since 2012 (Cooperation started in the 1990s)

- **China-British**

- ✓ CSNS-ISIS joint laboratory on neutron science technology and application





Opportunities

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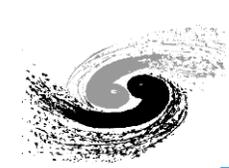
We are always searching for more excellent scientists and engineers at all career stages to join us in exploring this amazing universe.

We have long- and short-term opportunities available in our world-class research programs in the fields of

- Experimental particle physics
- Accelerator science and technology
- Theoretical particle physics and cosmology
- High energy astrophysics and instrumentation
- Modern X-ray research at HEPS
- Applications of synchrotron radiation
- Computer Science
- X-ray science and advanced X-ray instrumentation
- Materials and condensed matter science
- Neutron scattering science and instrumentation

We offers competitive pay and benefits programs to attract and retain talented people.

- Sufficient start-up funding
- Competitive salary & housing subsidy
- Relocation expenses
- All standard benefits: insurance package, etc
- Help in enrolling children in kindergarten and school



Recruitment programs - Staff

Contact: lianggj@ihep.ac.cn,
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I. Full Professors

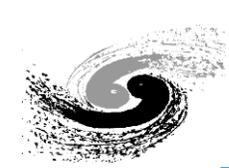
- A current appointment as a Full Professor (or equivalent rank) at a world-leading university or research institution;
- a distinguished international reputation and a proven record of academic leadership;
- pioneering expertise in key technologies relevant to IHEP's mission.

II. Associate Professors

- PhD with at least 3 years of postdoctoral or equivalent research experience;
- Typically within 15 years of receiving the PhD;
- Strong publication record and demonstrated ability to pursue independent research
- Exceptional candidates with outstanding achievements may be considered with flexibility on the research experience requirement.
- Tenure-Track Associate Professor positions are available

III. Tenure-Track Assistant Professors

- PhD with at least 2 years of continuous postdoctoral research experience;
- Typically within 6 years of receiving the PhD.
- Demonstrated research excellence and clear potential to develop an independent program.



Recruitment programs - Staff

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Mobile:+86-15810350906

IV. Key Technologists

- Advanced degree (PhD preferred, or Master's with substantial R&D experience) in engineering, physics, computer science, or a related field;
- Proven track record of innovation in instrumentation, detector systems, accelerator technology, or large-scale scientific infrastructure;
- Typically within 15 years work experience.

V. International Postdoctoral Fellowship

- Outstanding early-career scientists (PhD awarded within the last 3 years) with exceptional research records and innovative project proposals. Prestigious fellowship with dedicated funding, mentorship, and career development support.

VI. Special Experts program, 2-3 year term, continuation available

- Need to apply for CAS President's International Fellowship Initiative (**PIFI**) for Special Experts, Chinese Academy of Sciences
- Ph.D. degree



Postdocs

Unlike relatively smaller university groups, **IHEP is always open** to postdoc applications in almost **all research areas**. IHEP has 230 postdocs now.

- Competitive salary (250-600k RMB/yr, in average 350k RMB or 45k Euro/yr)
- Opportunities working in
 - ✓ International projects such as ATLAS, CMS, LHCb, ..., and other smaller scale experiments
 - ✓ World-leading experiments (also have very good international environment) hosted by IHEP, such as BESIII, JUNO, LHAASO, HERD, CEPC pre-research...
 - ✓ Fast developing and expanding areas, such as synchrotron radiation and neutron science, ...
- Opportunities for IHEP permanent positions



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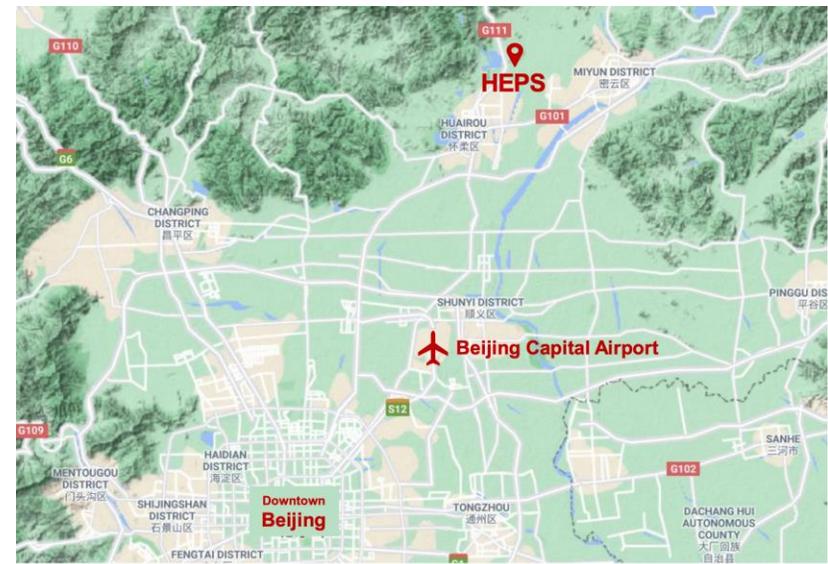
With easy access to investment and enterprise services, a business can be established with ease

Experience Beijing like a local with our scenario-based city services at your fingertips.

Work with us at HEPS!

Building international working environment
International life environment supported by local government

HEPS Bird's eye view



Campus life



Badminton courts



Gym



Swimming pool



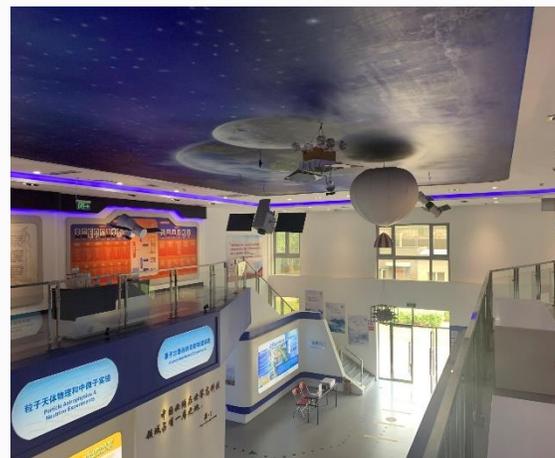
Table tennis room



Cafeteria



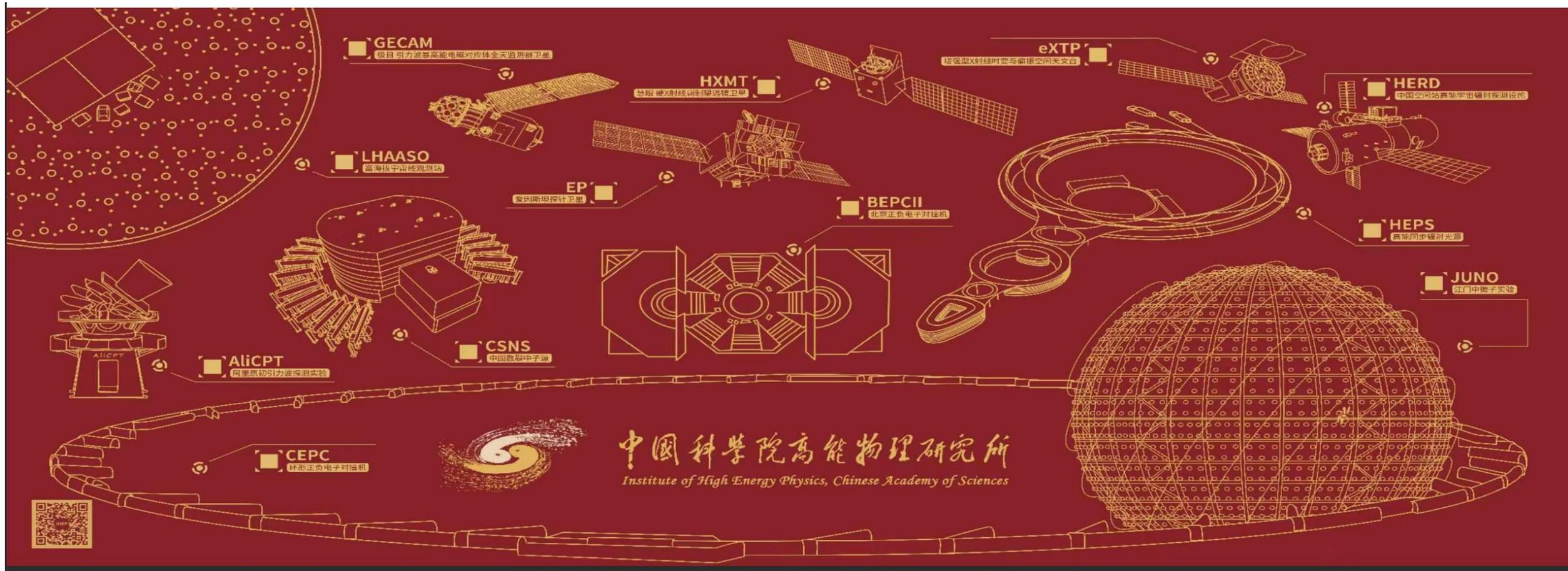
Kindergarten



Science exhibition hall



Library



Thanks!